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Integrated Water Resource Plan
The Big Picture

Presented by Kevin Lusk, Principal Engineer

Agenda

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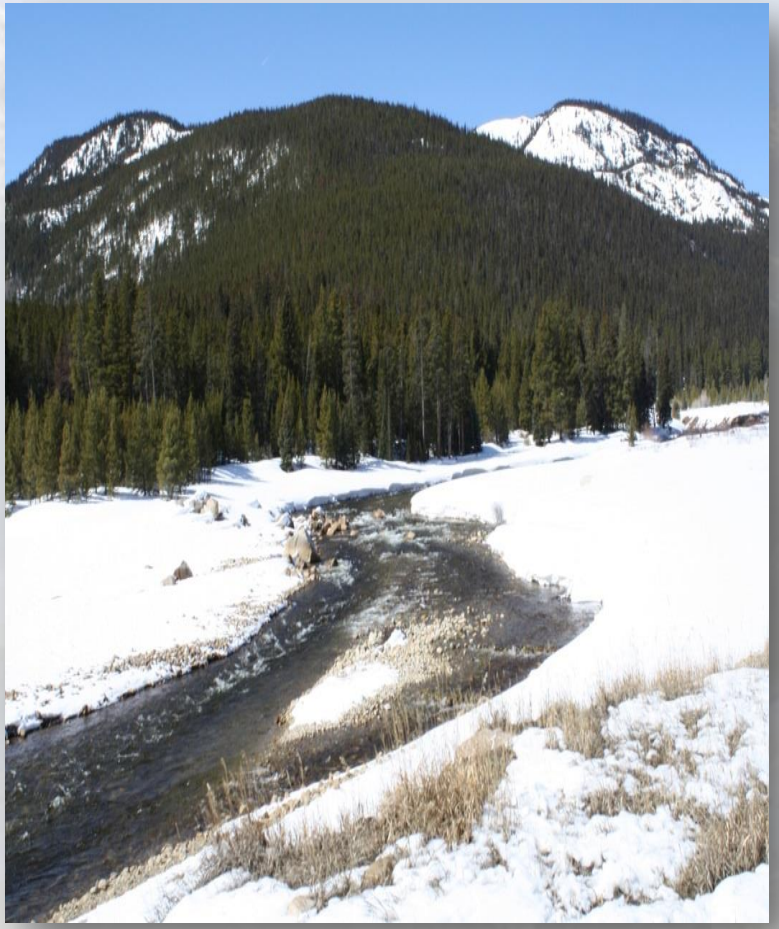
- Integrated Water Resource Plan (IWRP) Recap
  - Background
  - Purpose
- Risks and opportunities
  - System assessment
  - Regionalization
- Options to mitigate risks
  - Policies and projects
  - Portfolios
- Public Process
- Next Steps



IWRP fun fact

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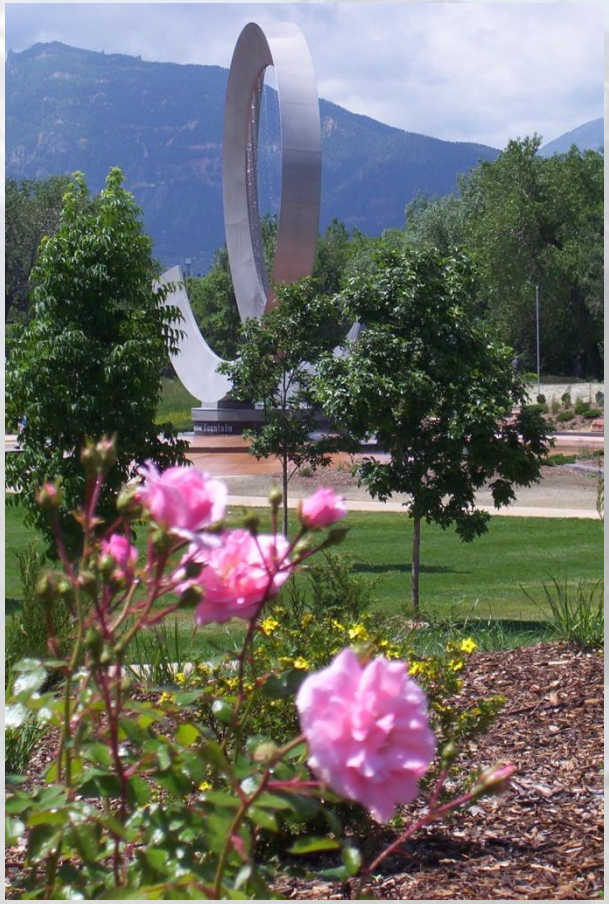
Water

Colorado Springs is the second largest city in Colorado and is not located near a major water source.



Background

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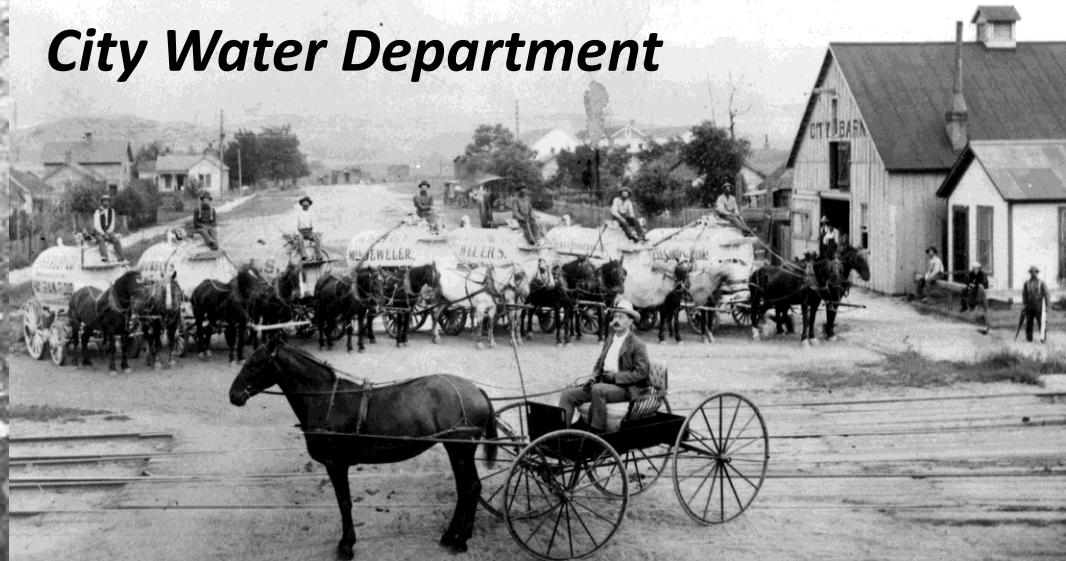
We have come a long way……

1909.—TEN PAGES. WEDNESDAY. PRICE FIVE CENTS

CITY OF VICTOR SUPPOSED TO BACK WATER ROBBERY

Six Armed Men Hold Up Caretaker of Colorado Springs Water System on Slopes of Pike's Peak and Open the Head Gates, Thereby Turning 20,000,000 Gallons of Water to Victor

City Water Department



Colorado Springs Water System

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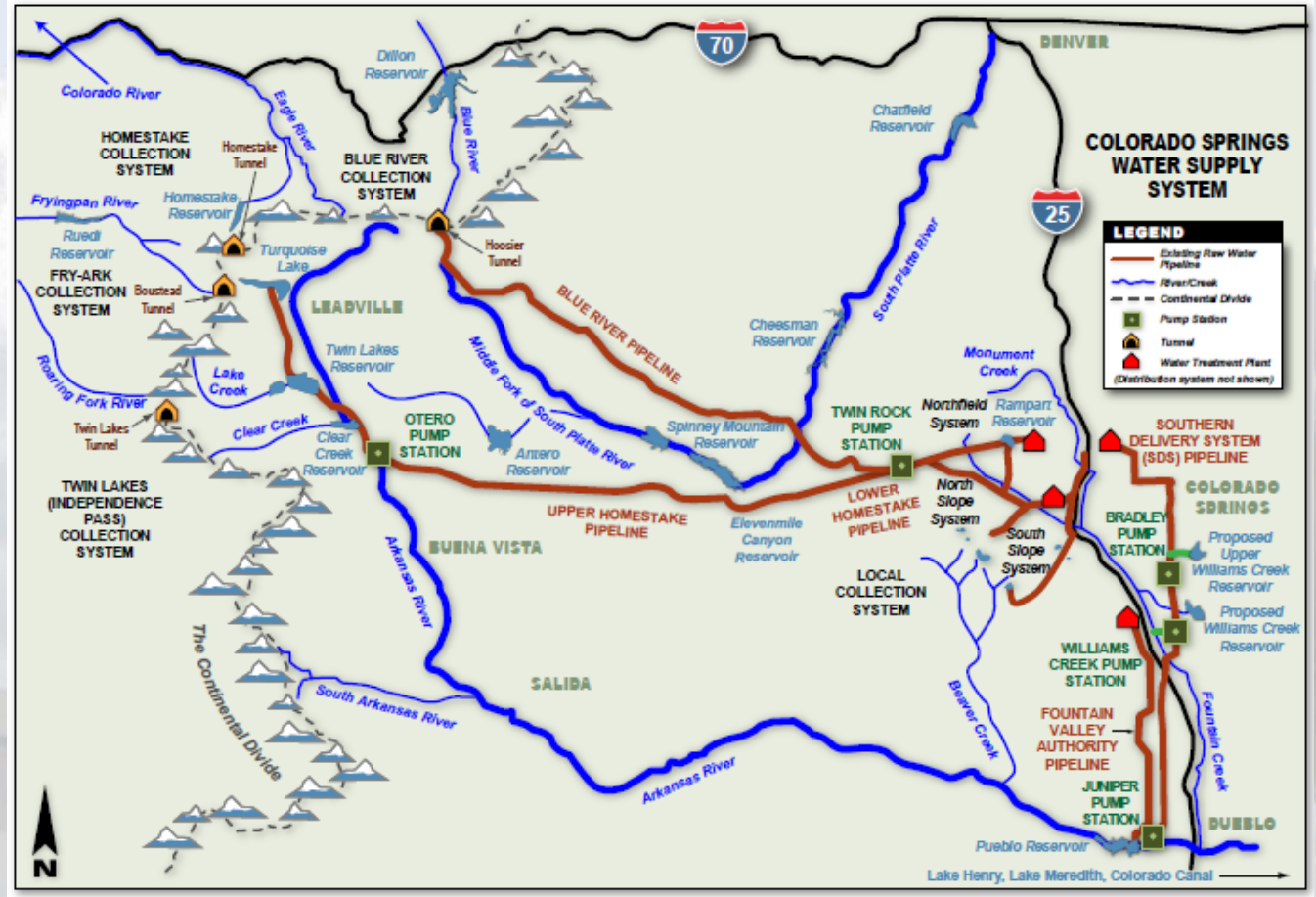
- Complex system
- Collects water from 3 different River Basins
  - Arkansas, Colorado, South Platte
- 70% comes from over Continental Divide (Colorado River)
  - 4 collection systems with 4 tunnels
- Delivered by 4 transmission pipelines
  - 250 miles of pipe
- Water travels up to 100 miles to the city
- 25 reservoirs used to store water



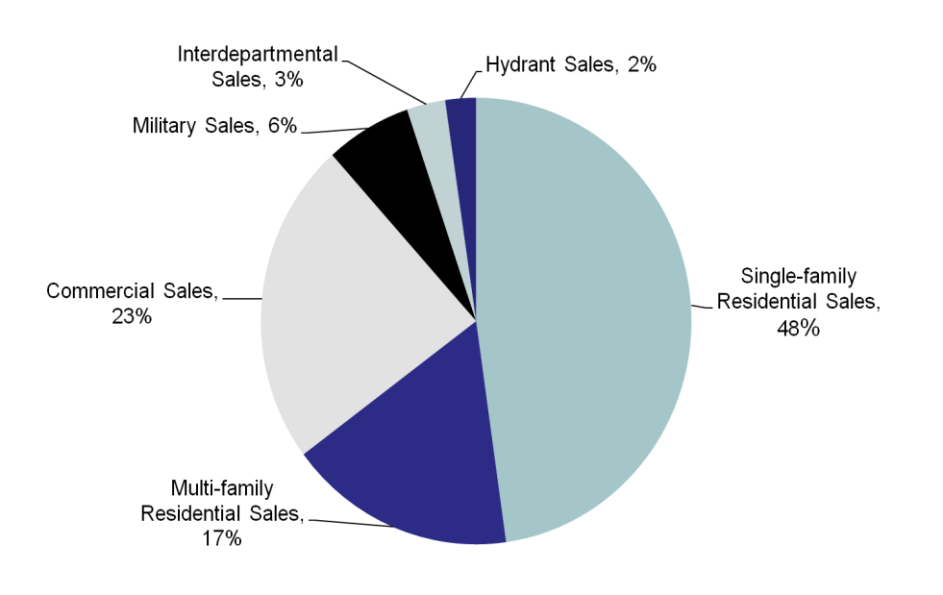
Water use

- Average potable deliveries - 75,000 AF
- Average Nonpotable deliveries - 10,000 AF
- Average Total deliveries - 85,000 AF

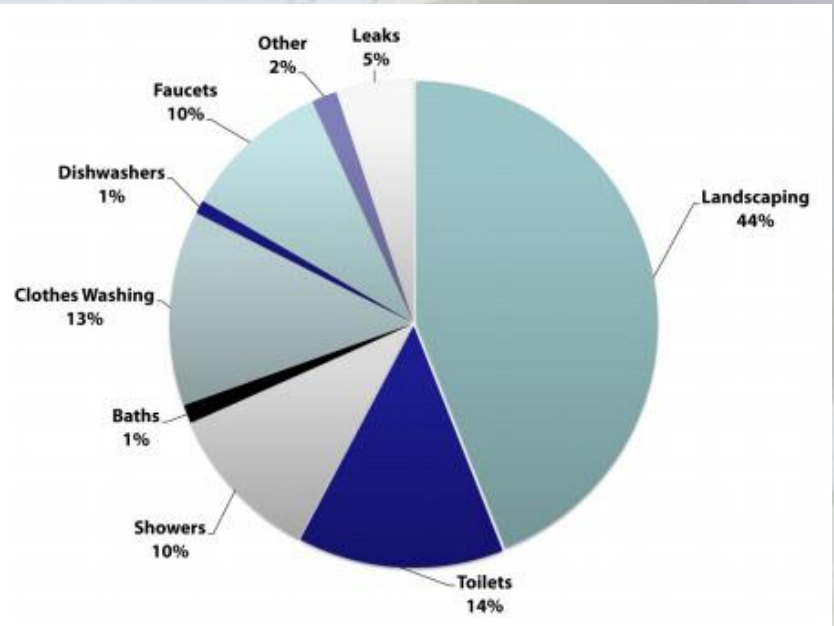
- Average system use - 145 gpcd
- Average single family residential use - 94 gpcd

Water Sales by Classification

2008-2013 Average



Colorado Springs Residential Water Use



Source: https://www.csu.org/CSUDocuments/watertour.pdf

Deliveries are average of last 5 years

IWRP Purpose

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- Last Plan completed in 1996
- Road map for the future
- Long-range plan for buildout
  - ~ 50± years
- Examining
  - water supply
  - water demand
  - water quality
  - infrastructure
  - energy
  - regulatory, legal issues,
  - and public opinion

IWRP Goals

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The goals of the Integrated Water Resource Plan (IWRP) are to sustainably address water supply and demand issues, while reflecting our community values, and to be adaptable to changing conditions.

What we want to find out

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- **How are we doing?**
  - Assess system based on new conditions and data, and better understanding
  - Improved performance measures to evaluate our current water rights and water system
- **What should we be prepared for?**
  - Detailed understanding of risks and opportunities
- **What options can we implement?**
  - Selection of water resources strategies (projects, programs, and policies) that perform well over a range of possible futures
- **What sign-posts should trigger specific actions?**
  - Road map for future water resources decision-making

Risks and Vulnerabilities

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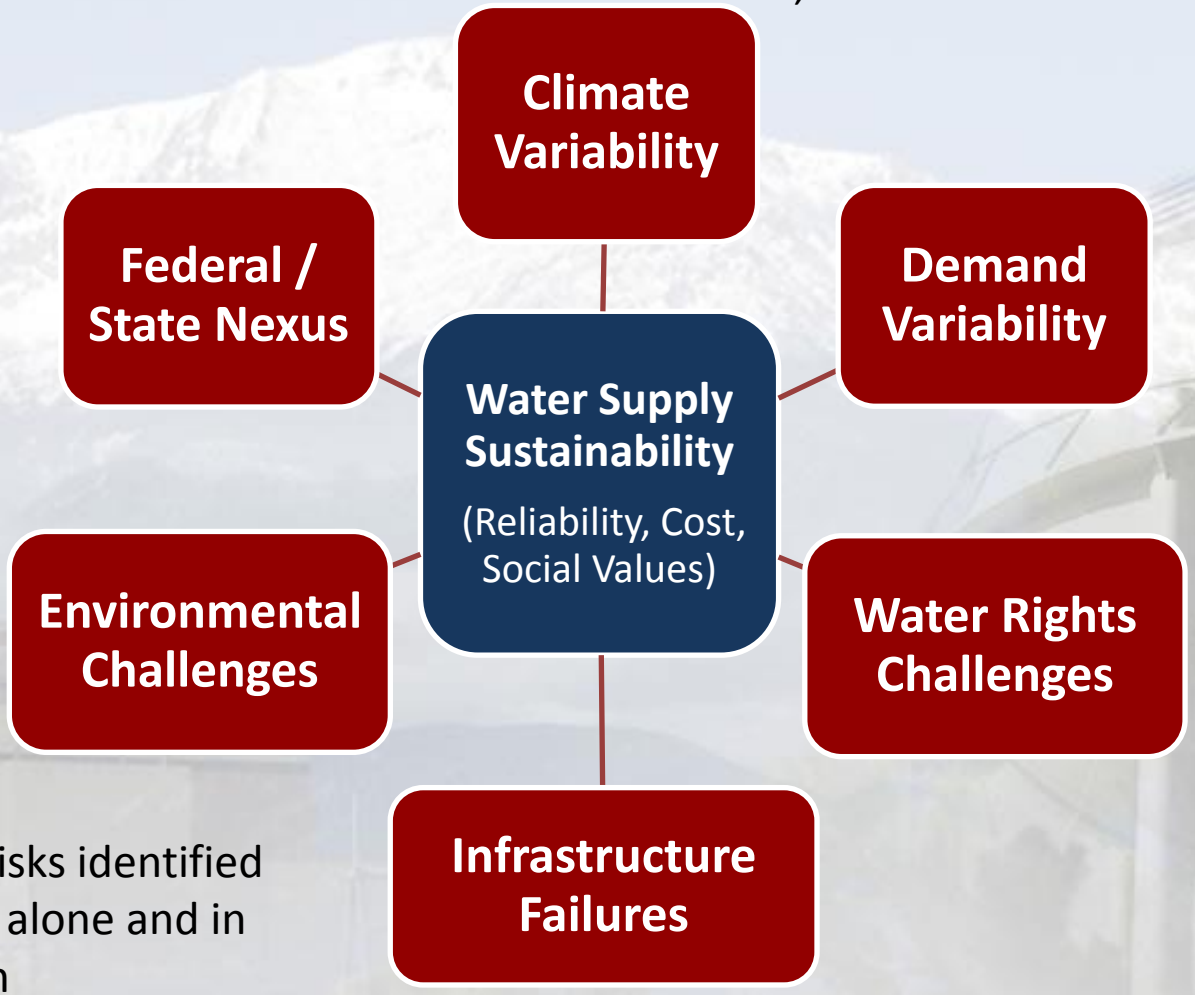
10,000 future climate sequences



- About 100 risks identified
- 65 analyzed alone and in combination
- Acute and chronic in nature

Risk Prioritization - #1 Climate

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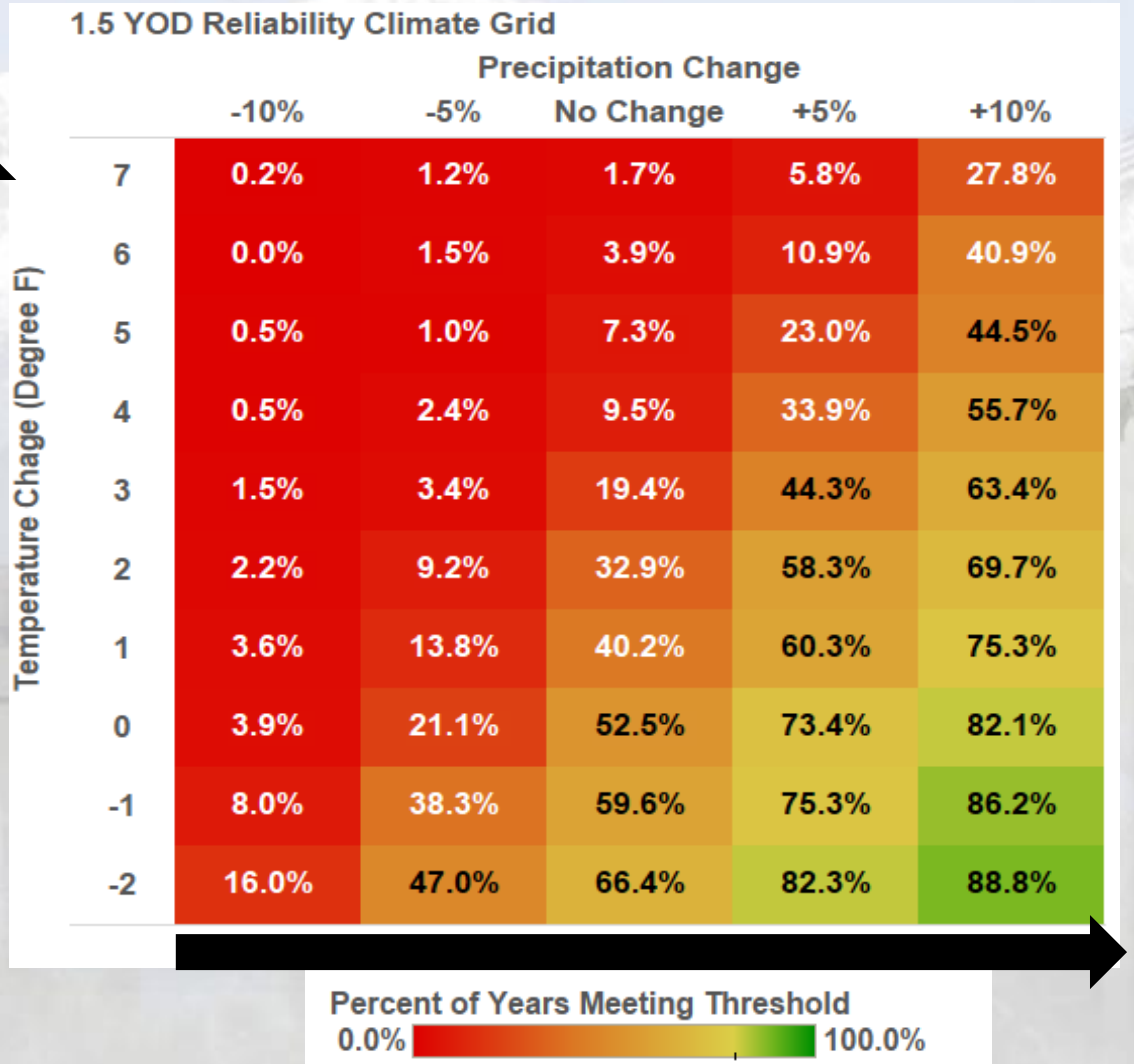
Decreases in precipitation will reduce performance even further

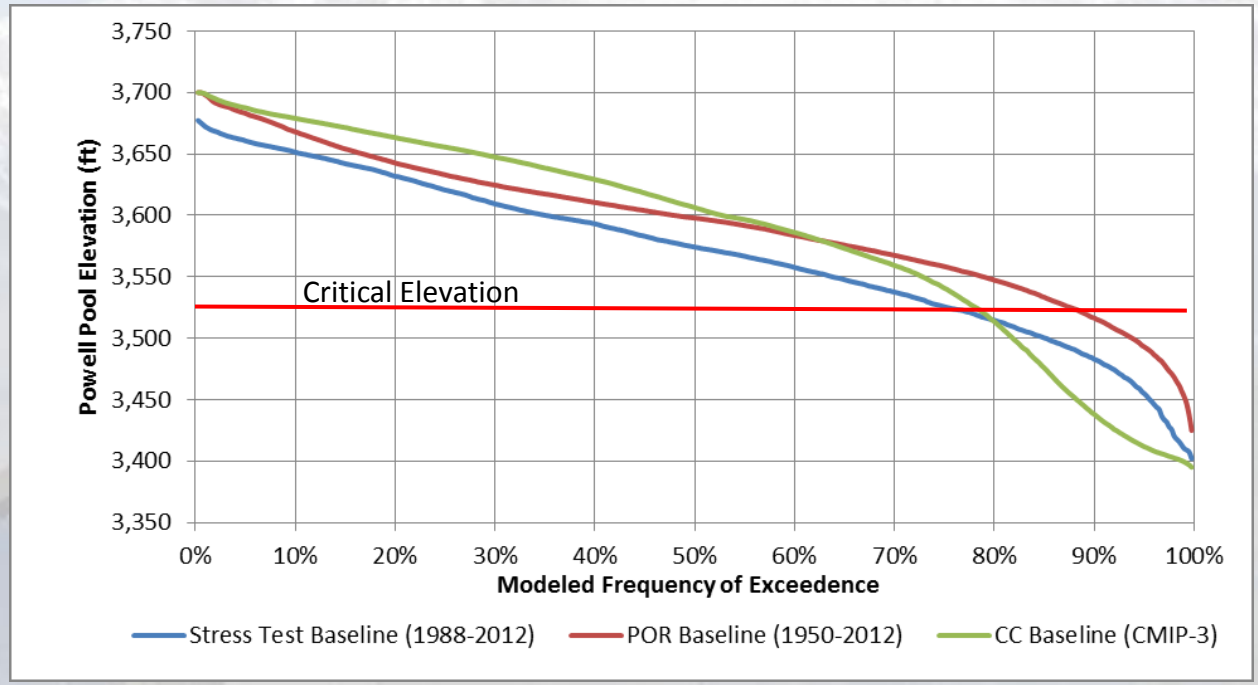
A warmer climate will negatively impact performance, potentially significantly

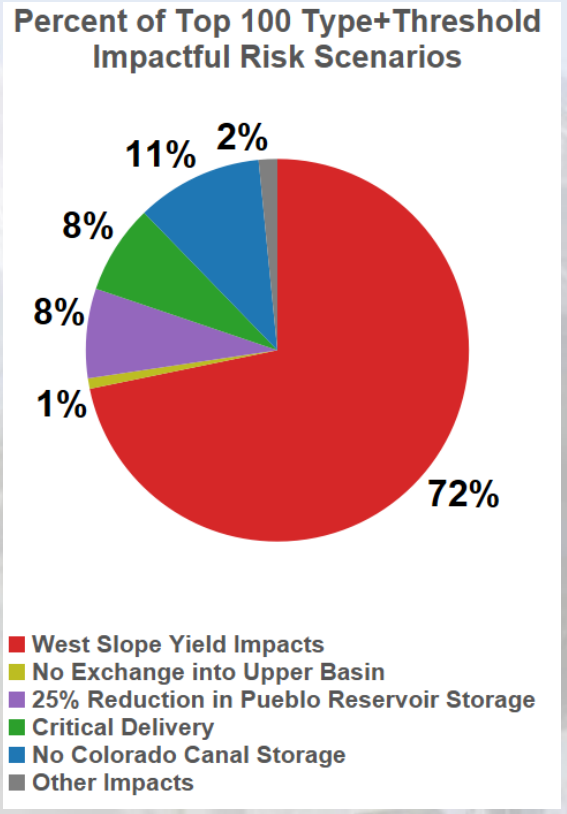


Increases in precipitation can help, but may not be likely

Risk Prioritization - #2 Colorado River

- Colorado River Compact
- Lake Powell Elevations
- Extended drought





Risk Prioritization - Future Demands

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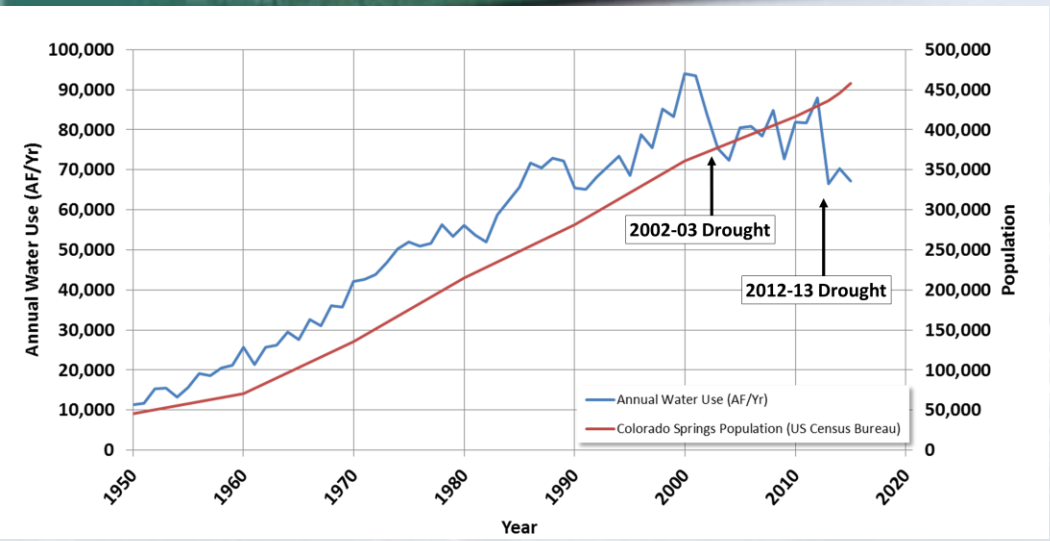
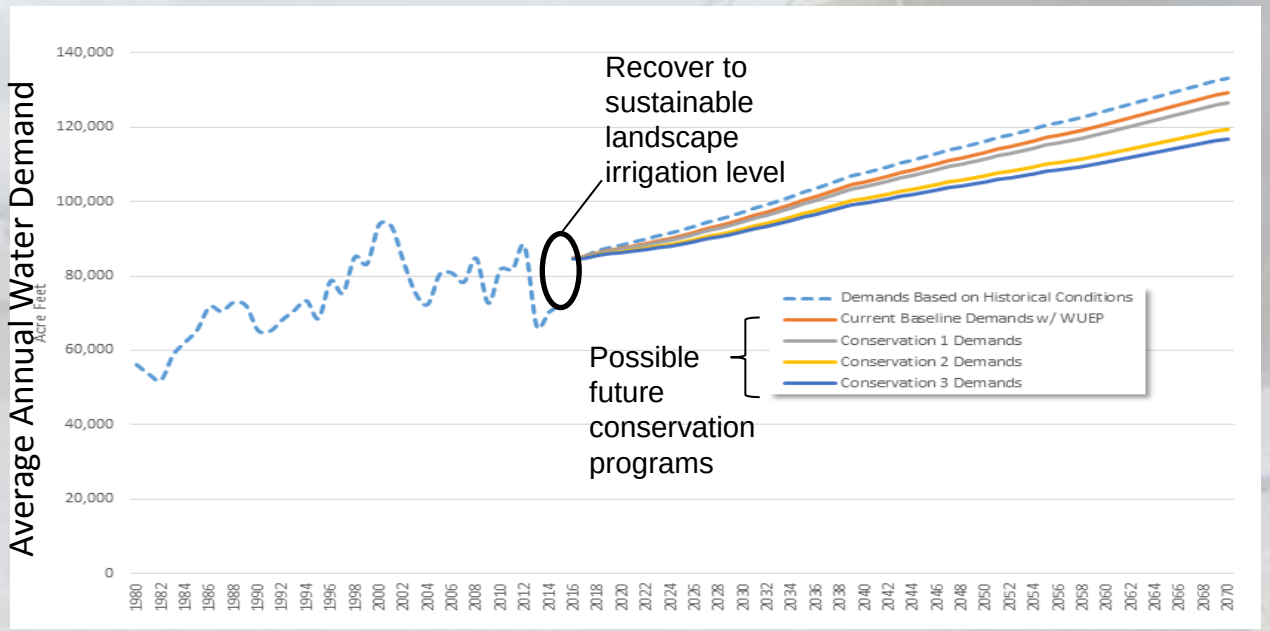


Uncertainty of future demands



Risk/Opportunity

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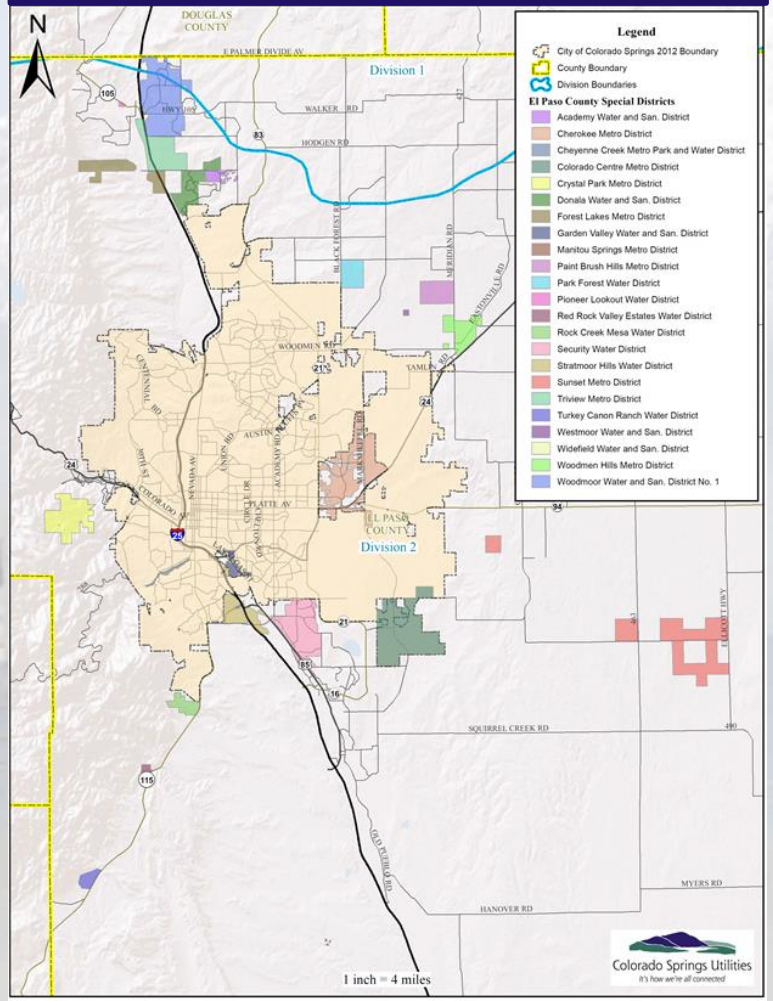
Regionalization

Potential Regional Partners



Possible Regional Strategies

If/When Provider

Utilities could provide regional partners with water if/when supply or delivery capacity is available and allows them to use Utilities infrastructure to deliver their own water.

Wholesale Provider

Utilities could provide regional partners with a firm supply of water as if they were service area customers. This is similar to how Denver Water operates with regional partners.

No Partners

Utilities could chose to not partner with regional entities.

Risks Becoming Reality

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Homestake Pipeline failure due to a rock slide

Low levels in Lake Mead and Lake Powell resulting from over-appropriation and drought.

Wildfire effects - West Monument Creek

Water Quality Issues - more stringent federal or state regulations

IWRP Options

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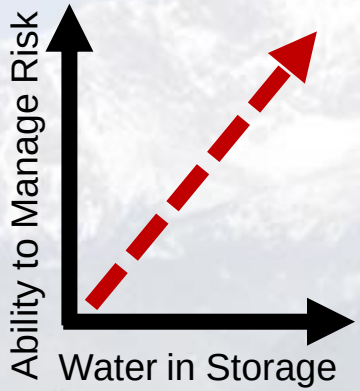
How do we mitigate against risks?

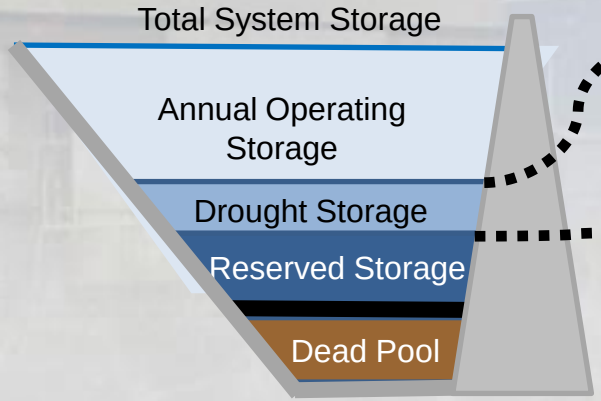
Reservoir Storage is our Insurance Policy



The volume of storage in reserve is our insurance against emergencies.

The size of this reserve impacts how many projects will be required to maintain safe storage levels, and how often we will need to be in watering restrictions.

Reservoir Storage is used in Different Ways



Key Storage and Risk Tolerance Decisions

1. **What is the right storage level for watering restrictions?**
   - Current policy 1.5 YOD
2. **What is the right storage level for insurance reserve?**
   - Current Policy: 1.0 YOD

IWRP Options

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It's a Difficult Balance

- **More Reserve Storage**
  - Fewer Restrictions
  - Higher Reliability
  - Higher Cost
  - Lower Social Impact
  - Lower Environmental Impact

- **Less Reserve Storage**
  - More Restrictions
  - More Risk
  - Lower Costs
  - Higher Social Impact
  - More Environmental Impact

IWRP Options

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How much are we willing to spend to reduce risk?

Risks We Can Plan Against

- Climate Variability
- Uncertain Demand
- Aging Infrastructure
- Population Growth
- Water Quality Threats
- Regulatory Changes
- Wildfire

Projects We Can Do to Minimize Risks


New Colorado River Supply


Agricultural Transfers


Conservation


Reuse & Non-Potable


New Storage

How much **risk tolerance** we want to build into the system…

…Drives how much of these **projects** we have to do…. which dictates **the cost…** (monetary, political, environmental, social, economic, etc.) to Colorado Springs.

IWRP Options

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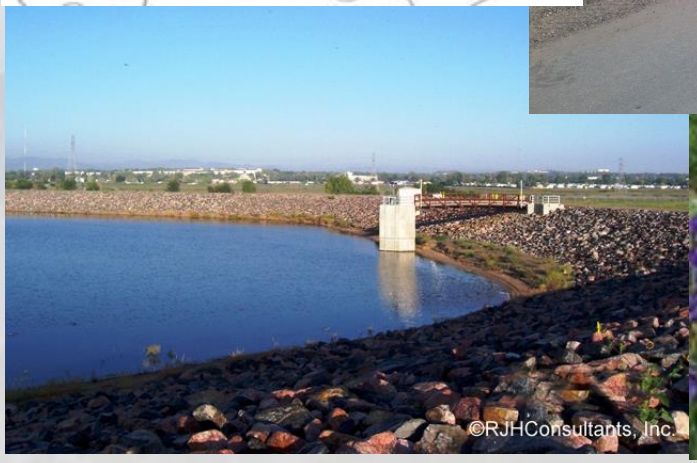
Types of Options to Reduce Risk

- Demand side management
  - Conservation and education
  - Land use policies
- New water supply
  - Acquisitions
  - Leasing
- New storage
  - Where?
  - How much?
- Conveyance projects
- When?
- Combinations?
- Tradeoffs?



IWRP Options

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- Colorado River Projects
  - Develop more water supply from the Colorado River basin

- Agricultural Transfers
  - Utilize agricultural water rights (either permanently or temporarily)
  - Mostly available in Lower Arkansas River Valley

IWRP Options

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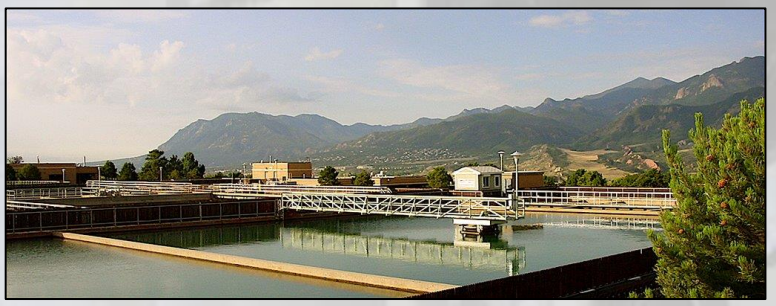
- Conservation
  - Enact programs and policies to reduce demands on system
- Storage
  - Build new storage reservoirs or expand existing ones
  - Multiple geographic locations
- Reuse
  - Expand existing non-potable system
  - Use either direct potable reuse (DPR) or indirect potable reuse (IPR)



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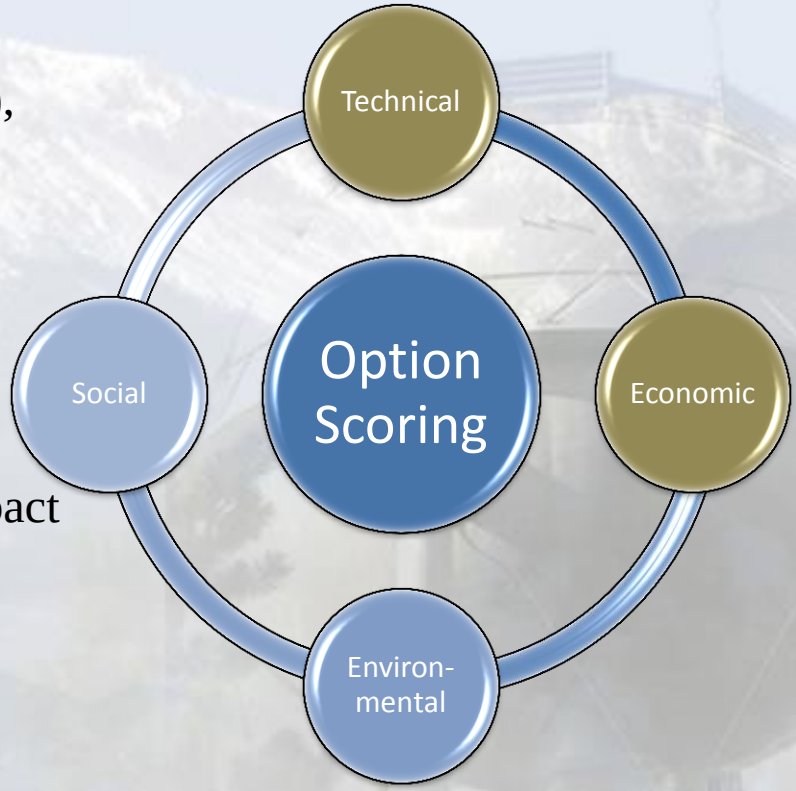
Option Evaluation Criteria

- Performance
  - Reliability (how often), Resilience (how long), Vulnerability (how bad)
- Technical
  - Phaseability and Timeliness, Dependencies, Potential Risk/Complexity, Water Quality
- Economic
  - Life-Cycle Cost, Cost Certainty, Revenue Impact
- Environmental
  - Permitting Difficulty, Geographic Footprint, Watershed Impacts, Wildlife Impacts
- Social
  - Regional Benefits, Impacts on Agriculture, Impact to Other Water Users, Political Complexity, Socioeconomic Impacts, Recreation



Selecting Future Portfolios

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- Selected at Buildout conditions with key vulnerabilities applied
- Select combinations that meet Risk Tolerance Levels
- All portfolios contain some mix of the IWRP strategies
  - Limiting one strategy increases reliance on others
- Select different future portfolios based on key assumptions
  - No additional Colorado River water, no conservation, etc.
- Select a robust portfolio that mitigates the widest range of risks
  - Phaseable - ordering and timing of projects based on "signposts"
- All IWRP strategies come with significant challenges
  - Political, life-cycle, cost, environmental, permitting, etc.
  - "Easy" projects no longer exist

Potential Future Portfolios

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Size of Balloon = Amount of Project Type Required

Balanced Portfolio

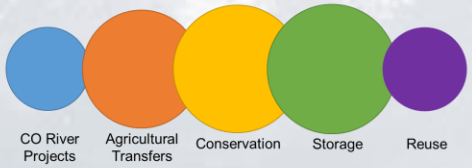
This portfolio utilizes relatively similar magnitudes of projects across all aspects of the system, which is consistent with how we have previously designed our system.

SDS Proposed Action

This portfolio assumes that all SDS related projects are completed as detailed in the original plan. This portfolio contains slightly more storage.

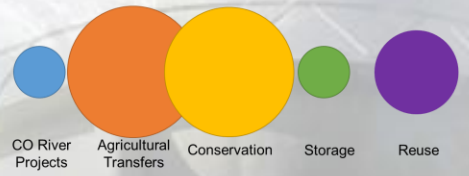
High Storage Reserve

This portfolio maintains a higher volume of water in storage reserve. The tradeoff is more agricultural transfers, conservation, and storage.



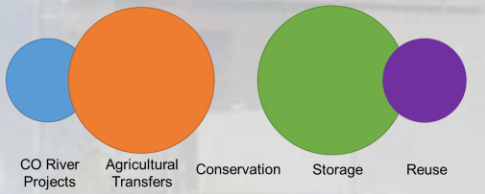
Highest Scoring

This portfolio uses projects based on social, environmental, technical, and economic criteria assigned by a advisory group of stakeholders.



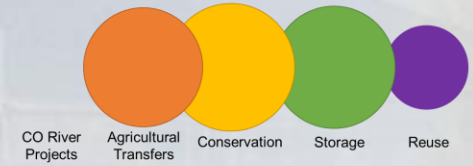
No Additional Conservation

This portfolio doesn't utilize any additional conservation. The tradeoff is a greater reliance on agricultural transfers and storage.



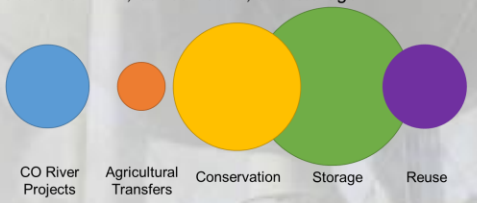
No Colorado River Projects

This portfolio doesn't use any additional projects in the Colorado River Basin. The tradeoff is a greater reliance on agricultural transfers and conservation.



Minimize Agricultural Impacts

This portfolio minimizes the amount of agricultural transfers Utilities will do. The tradeoff is a greater reliance on the Colorado River, conservation, and storage.



Public Process

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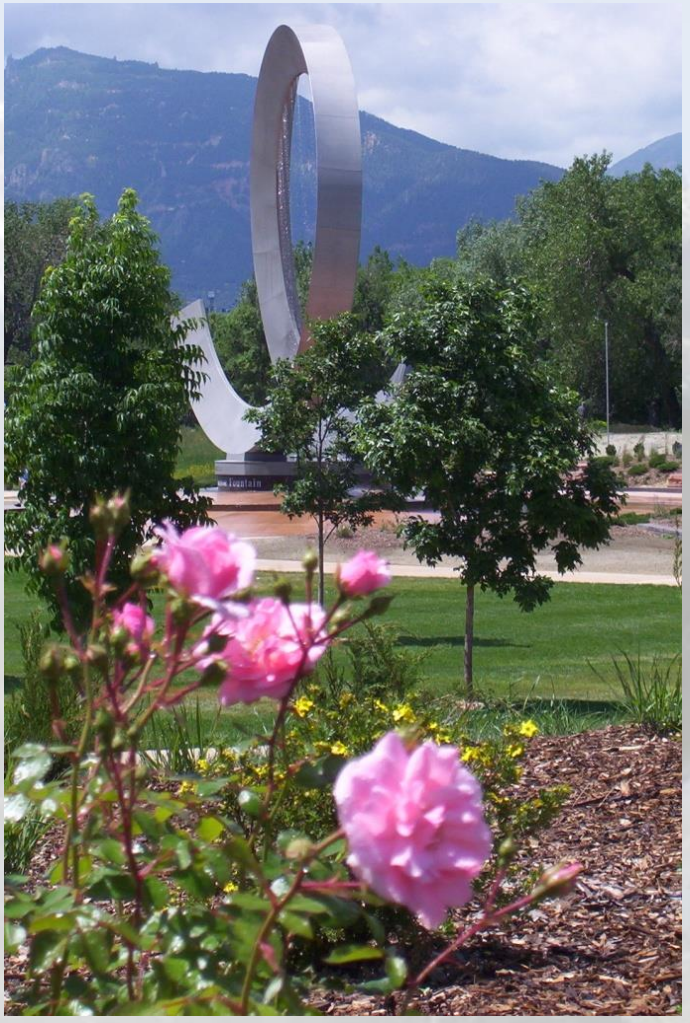
Outreach Efforts to Date

- Website:
  https://www.csu.org/Pages/iwrp-r.aspx
- Focus Groups
- Surveys
- Presentations/meeting with stakeholders
- Water Planning Advisory Group
  - 12 members
- Open Houses
- Printed Material



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What We've Heard So Far

- Water quality is important
  - Maintain high standards for safety and aesthetics
- Consider conservation as fits with other options
- Make sure Colorado Springs has the water it needs to serve current and growing community
- Help meet Regional partners' water needs
- Repair and maintain aging infrastructure
- Look at other methods to preserve/reuse water
- Help customers understand how to use water efficiently
- Try to minimize impacts to agriculture and environment

Public Process

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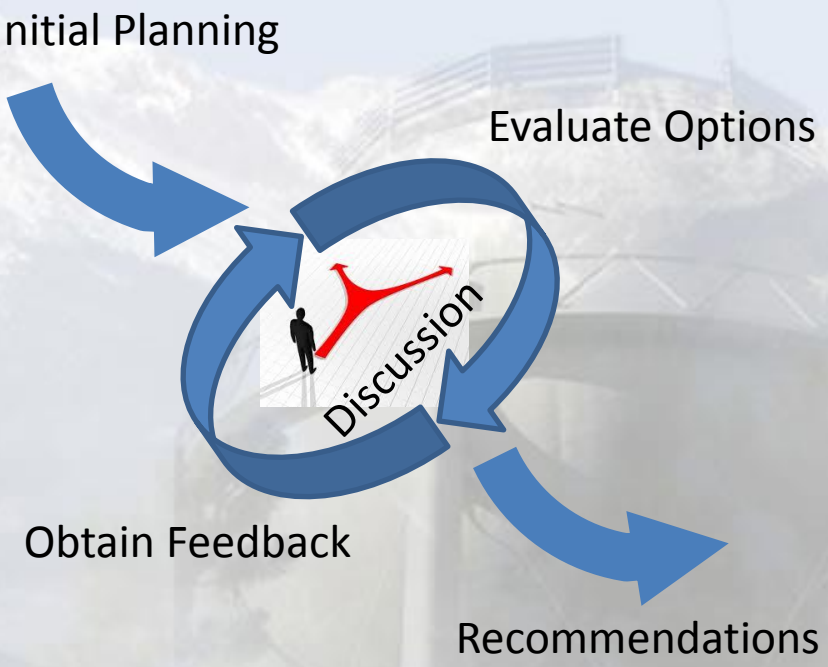
We Want Your Involvement!

- Visit **our website at csu.org** for:
  - project progress and updates
  - Next open house - October timeframe
- Watch for articles in the CSU Connection
- Stay involved and encourage friends, family, neighbors to participate
- Contact Gwen Happ for questions: ghapp@csu.org

Next steps

- Finalize Technical Analysis
  - Integrate Public Input
  - Propose implementation schedule and cost impacts
- Confirm Policy Direction
  - Risk tolerance levels and tradeoffs
  - Preferred Portfolio to mitigate risk
- Board Presentations / Approval
- Final Completion by Early 2017



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Questions/Comments

https://www.csu.org/Pages/iwrp-r.aspx

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